Rush University Medical Center

Department of Pathology



Illinois Registry of Anatomic Pathology

November 21, 2011

**Case #1**

**Presenter: Caitlin Schein, MD**

**Attending: Pincas Bitterman, MD**

**Clinical History:** 45-year-old woman with multiple medical problems presented with irregular menses and back pain. CT scan showed a complex, cystic mass in the right adnexa, measuring approximately 16cm.

**Diagnosis:** Granulosa cell tumor arising in conjunction with mature cystic teratoma

**Important Differential Diagnosis:**

* Sertoli-Leydig cell tumor
* Metastatic tumor
* Neuroendocrine tumor
* Juvenile granulosa cell tumor

**Key Morphologic Features of Adult Granulosa Cell Tumor:**

* Gross: partially solid, partially cystic, gray-white to yellow cut surface, often with focal hemorrhage, mean 12cm diameter
* Histology: small, polygonal cells with “coffee bean” nuclei, Call-Exner bodies, variety of architectural patterns

**Discussion:**

* Adult granulosa cell tumor is a rare ovarian tumor, accounting for 1% of primary ovarian tumors
* Peak incidence in women 50 to 55 years old
* 75% are associated with hyperestrogenism, and may cause endometrial hyperplasia or frank carcinoma
* Association with teratoma is extremely rare, with only 12 case reports in the English language literature
* Among the reported cases, the age range is 40 to 80 years old, and the tumor size ranged from 7-30cm
* Two-thirds of cases showed concurrent endometrial hyperplasia

**References:**

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**Case #2**

**Presenter: Tushar Patel, M.D.**

**Attending: David Cimbaluk, M.D.**

**Clinical History:** 31-year-old G1P1 presented to the emergency room with menorrhagia. Transvaginal ultrasound revealed a 1.7 x 1.6 x 1.5 cm heterogeneous mass within posterior wall of the cervix. Patient had remote history of papillary thyroid carcinoma, status post thyroidectomy. Patient underwent biopsy of cervical mass, followed by total abdominal hysterectomy and bilateral salpingoophorectomy.

**Diagnosis:** Alveolar Soft Part Sarcoma (ASPS) of the cervix.

**Important Differential Diagnosis of ASPS:**

* Cervical clear cell carcinoma
* Paraganglioma
* Alveolar rhabdomyosarcoma
* Perivascular epithelioid cell tumor (PEComa)
* Metastasis
  + Renal cell carcinoma
  + Melanoma

**Key Morphologic Features:**

* Nests of large, polygonal cells, separated by fibrovascular septa and delicate capillary-sized vascular channels.
* Cells have distinct cell borders, with abundant eosinophilic to clear cytoplasm, often granular.
* Characteristic periodic acid-Schiff (PAS) positive, diastase resistant crystalline structures.
* Round, regular, eccentrically placed nuclei with vesicular chromatin and a prominent central nucleolus.
* Rare mitotic figures.

**Discussion**

* A rare malignant tumor, typically occurring in adolescents and young adults, with slight female predilection.
* Most commonly involves muscle and deep soft tissue of the extremities, trunk, head and neck (especially in children), and the retroperitoneum. Rare cases described as primary to the gynecologic tract.
* Clinical course is indolent, characterized by late metastasis, most commonly to lung, bone, brain, and liver.
* Typically negative for epithelial, neuroendocrine, and melanocytic markers.
* Characterized by unbalanced t(X;17) (p11;q25), fusing transcription factor 3 (TFE3) gene at Xp11 and the alveolar soft part sarcoma locus (ASPL) gene at 17q25, creating a ASPL-TFE3 fusion protein.
  + Strong, nuclear positivity is diagnostic; however, can be seen in other tumors with TFE3 gene fusions. These tumors include:
    - Translocation-type renal cell carcinomas
    - Granular cell tumor
    - Chordomas
    - Malignant peripheral nerve sheath tumor

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**Case #3**

**Presenter: Jennifer Dettloff, M.D.**

**Attending: Shiram Jakate, M.D.**

**Clinical History and Ancillary Studies:** A 58-year-old male presented with abdominal pain and worsening abdominal distention. CT scan showed a large central abdominal mass attached to the small bowel. FNA of this mass showed GIST. During removal the mass and a portion of the small bowel, small nodules were noted on the surface of the liver, and one such nodule was biopsied. The section provided represents the liver nodule. Imaging did not show any liver lesions

**Diagnosis:** Metastatic incidentally discovered GIST

**Important Differential Diagnosis:**

* Hepatocellular Carcinoma
* Cholangiocarcinoma
* Metastatic Gastrointestinal Stromal Tumor

**Key Morphologic Features:**

* Gross: Small incidentally discovered 4mm nodule that that was not visible grossly
* Histology: Showed a different morphology from the primary tumor being composed of epithelioid cells arranged in trabeculae.
  + Primary tumor showed the typical spindled cell pattern of GISTs of the small bowel.

**Discussion:**

* GISTs are the most common mesenchymal tumors of the GI tract
* These tumors can occur anywhere along the GI tract but the most common sites are the stomach and the small intestine
* Histology of GISTs can vary depending upon where they are located along the GI tract
  + The histology of GISTs arising from the small bowel are even more often spindled than GISTs that arise from the stomach and epithelioid GISTs of the small bowel are often associate with malignancy.
* Likelihood for metastasis depends upon location, tumor size and number of mitoses.
* We have not found any papers describing a different morphology upon metastasis.
* These tumors are often caused by mutations in the tyrosine kinase receptors Kit or PDGFRalpha.
  + Kit is mutated in approx 90% of GISTs and these GISTs typically stain positive for c-Kit.
  + PDGFRalpha mutations usually do not stain positive for c-Kit but their detection is important because they may respond to Tyrosine Kinase Receptor inhibitors**.**
* DOG1 stain has a higher sensitivity and specificity than c-Kit in the detection of GISTs.

**Treatment:** Surgical resection and Tyrosine kinase inhibitors.

**References:**

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2. Jain D, Sarode V, Abdul–Karim FW, Homer R, Robert ME. Evidence for the Neoplastic Transformation of Von-Meyenburg Complexes. *American Journal of Surgical Pathology* August 2000; Vol 24(8); 1131-1139.
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**Case #4**

**Presenter: Dawn Heagley, DO**

**Attending: Paolo Gattuso, MD**

**Clinical history:** A 51-year-old male presented for annual check-up. On physical exam, he had an enlarged thyroid. Labs showed an elevated TSH. He was diagnosed with hypothyroidism and placed on synthroid. Subsequently the patient developed hyperthyroidism, which was refractory to medical treatment; CT showed an enlarged thyroid with mild tracheal narrowing. The patient elected to have a total thyroidectomy.

**Diagnosis:** Calcitonin negative medullary thyroid microcarcinoma (Atypical medullary thyroid microcarcinoma)

**Important Differential Diagnosis:**

* Solid cell nest
* Calcitonin negative neuroendocrine tumor (CNNET)
* Metastatic neuroendocrine carcinoma

**Key morphologic features Calcitonin Negative Medullary Thyroid Carcinoma:**

* Three main patterns: sheets, nests or trabecula
* Usually not encapsulated; shows infiltration and entrapment of the adjacent normal thyroid follicles
* Polygonal, round or spindle cells with granular or clear cytoplasm and round nuclei with coarse chromatin and indistinct nucleoli.
* Some cases are highly vascular with hyalinized collagen
* Immunophenotypically the cells stain positive for TTF-1, synaptophysin, chromogranin, and low molecular weight keratins and negative for calcitonin, thyroglobulin and p63.

**Discussion:**

* Calcitonin negative and calcitonin weak staining medullary thyroid carcinomas are rare with only a dozen reports in the literature. (This entity has also been call atypical medullary thyroid carcinoma by some authors).
* Diagnosis of Calcitonin-negative medullary thyroid carcinomas should only be made within a familial setting or there is unequivocal C-cell hyperplasia
* Medullary thyroid carcinomas comprise 5-10% of all thyroid malignancies. Medullary thyroid carcinomas occur sporadically or in a familial syndrome such as Multiple Endocrine Neoplasia, type 2 or familial medullary thyroid carcinoma. While sporadic cases are occasionally associated with RET mutations (20-80% of cases), all of the familial syndromes are associated with a RET mutations.
* A small subset of patients with MEN 2A, have been shown to have incidental papillary thyroid carcinomas. This may be due to a structural alteration affecting several contiguous genes spanning the MEN2 region and may represent a variation of the MEN 2A syndrome.
* In patients with surgically removed thyroids for benign conditions, incidental papillary thyroid carcinoma and medullary thyroid carcinomas occur in 12% and 0.14-0.57% of cases respectively.

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**Case # 5**

**Presenter: Ihab Lamzabi, M.D.**

**Attending: Ira Miller, M.D., Ph.D.**

**Clinical History:** A 16-year-old boy with no significant prior medical history presented with right shoulder pain of one-year duration. The pain was increasing progressively in intensity.

**Physical Examination and Ancillary Studies:** The physical examination revealed limitation of right shoulder mobility. The MRI and CT scan showed a polylobulated mass in the right glenoid destroying the bone and extending to the soft tissue. WBC and CRP were within normal limit and ESR was slightly increased.

**Diagnosis:** Rosai-Dorfman disease of the bone

**Important Differential Diagnosis:**

* Langerhans cell histiocytosis
* Osteomyelitis
* Classical Hodgkin’s lymphoma

**Key Morphologic Features:**

* Gross: soft to gritty with white to grey tan color.
* Histology: Histiocytes, plasma cells and lymphocytes in a fibrotic background
  + Histiocytes: Large cell with clear watery cytoplasm, oval nucleus with open chromatin, usually one conspicuous nucleolus. Some of them have emperipolesis or lymphophagocytosis with lymphocytes housed within the cytoplasm inside vacuoles. The background shows lymphocytes, plasma cells and few neutrophils. Eosinophils are rarely seen. Atypia and mitosis can be present. Emperipolesis is less frequent in extranodal locations.
  + Emperipolesis, even though it is not pathognomonic, is mandatory to make the diagnosis of RDD.
  + The histiocytes are CD68 and S100 positive and CD1a negative.

**Discussion:**

* Rosai-Dorfman disease is a proliferation of histiocytes, possibly a manifestation of an altered immune response.
* The patients are usually adolescents or young adults, and usually present with fever, increased white blood cell count, increased ESR and often, massive lymphadenopathy. The disease regresses spontaneously in the majority of the cases.
* Co-occurrence with Langerhans cell histiocytosis and lymphomas have been reported.

**References:**

1. Foucar E, Rosai J, Dorfman R. Sinus histiocytosis with massive lymphadenopathy (Rosai-Dorfman Disease): Review of the entity. *Seminars in Diagnostic Pathology* (1990) 7: 17-73.
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**Case #6**

**Presenter: Dr. Richa Jain MD**

**Attending: Dr. Shriram Jakate MD, FRCPath**

**Clinical History**: A 48-year-old man presented with abdominal pain, progressive watery diarrhea, nausea and vomiting for 2 days. He had a history of acute myeloid leukemia, M5, diagnosed 2 years ago, and was s/p peripheral stem cell transplant 1 year ago. Significant events after bone marrow transplant included neutropenic fever, hepatosplenic candidiasis, multiple episodes of GVHD and CMV viremia. All of his previous problems had resolved at the time of current presentation. Three weeks after admission he underwent right hemicolectomy for refractory diarrhea, increasing abdominal discomfort and diagnosis of pneumatosis intestinalis on CT scan.

**Physical examination**: Significant findings included diffusely distended tender abdomen without organomegaly. Other systems including skin and mucous membranes were within normal limits.

**Laboratory findings**: CBC was consistent with engraftment profile. Serology for various infectious diseases was negative.

**Imaging**: Initial CT scan of the abdomen was unremarkable. However, 3 weeks following admission the CT scan showed gas in the bowel wall diagnostic of pneumatosis intestinalis and free air in the peritoneal cavity.

**Diagnosis**: Recurrent acute GVHD, Grade IV, and pneumatosis intestinalis.

**Differential Diagnosis**:

* Graft versus host disease:
  + History of bone marrow transplantation. Rarely, patients have a history of solid organ transplant or blood transfusion.
  + Constellation of clinical findings involving skin, liver and GI tract
  + Non-specific endoscopic findings.
  + Histological hallmark is finding apoptotic bodies in the crypt epithelium and sparse mononuclear inflammation.
* Mycophenolate (MMF) toxicity:
  + MMF is used to treat GVHD and the histological changes mimic low grade GVHD.
  + Manifestations only involve lower GI tract and not skin or liver.
  + Histologically dilated damaged crypts are said to be relatively specific for MMF toxicity.
* Infectious (specially CMV) colitis:
  + Patients are immunosuppressed, hence, predisposed for infections. Also, infections and GVHD can co-exist.
  + Histologically, there would be cryptitis, crypt abscesses and lamina propria inflammation in addition to specific viral inclusions or fungal forms.
* Pneumatosis intestinalis:
  + Defined by presence of gas within the bowel wall.
  + Grossly, the bowel wall is crepitant.
  + Histologically, the empty cyst-like spaces are lined by macrophages and multinucleated giant cells that are CD68 positive.
* Lymphangiectasia:
  + The cyst like spaces contain fluid and are lined by endothelium, which is positive for CD31, CD34 and D2-40.

**References**:

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**Case #7**

**Presenter: Matthew Stemm MD**

**Attending: Jerome Loew MD**

**Presentation:** 31-year-old woman who initially presented with worsening neck pain. She was seen in an urgent care clinic and treated for muscle spasm. The patient had persistent neck pain and headache and was transferred to Rush for further management.

**Clinical History:** Unremarkable

**Physical Exam:**  Resistant to any movement of neck. Focal tenderness at midline around the base of occiput. Otherwise unremarkable exam. Laboratory examination unremarkable as well.

Radiology: 5 x 3 x 3 cm calcifying clival mass with mass effect on right side of medulla.

**Diagnosis:**  Calcifying pseuoneoplasm of the neural axis (CAPNON)

**Differential Diagnosis:**

* Infectious granulomatous disease
* Phosphaturic mesenchymal tumor
* Tumoral calcinosis
* Meningioma
* Chordoma
* Any calcifying lesion needs to be considered, as this lesion can take show many forms of calcification

**Histology:**

* Calcification
* Palisading spindle to epitheliod cells
* Variable amounts of fibrous stroma
* Foreign body giant cell reaction
* Not featured in our case though possible in this lesion:
* Chondromyxoid matrix in a nodular pattern
* Osseous metaplasia or psammoma bodies

**Epidemiology**: This lesion is very rare, with only 32 cases reported worldwide. It was first described by Rhodes and Davis in 1978. The tumors are found along the neural axis anywhere from L2 to frontal lobe. The age range is wide (6-83 years). Due to the low number of reported cases, accurate statistical analysis is impossible. Usually these patients present with pain, though depending on size and location, other compressive symptoms are possible. These can be asymptomatic as well.

**Etiology:** The pathogenesis is still unknown. It was originally thought to be an unusual form of tumoral calcinosis. Others have suggested it to be an abnormal healing response. Possible tissue of origin includes arachnoid or fibroblasts in the choroid plexus stroma.

Treatment: Simple resection without chemotherapy or radiation. A benign course is typical and to date only one case has shown recurrence. 2 fatalities have been reported due to CAPNON, tough they have been due to complications related to anatomic location and not progression of disease.

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Special thanks to Dr. K. Krishnan Unni for reviewing the case.